After Sales Technical Documentation

THX–4 Series Transceiver

Chapter 5

DISPLAY MODULE

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CHAPTER 5 – DISPLAY MODULE

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Introduction

The Display Module controls the operation of the display and backlighting.

The Display Module is controlled by the System Module.

Technical Specifications

External Connectors

The Display Module is provided with 18 connections to the System Module.

Display Module Connector J2

Pin	Name	Description
1	ROW1	Keyboard input line to system module
2	COL0	Keyboard output line from system module
3	ROW0	Keyboard input line to system module
4	COL3	Keyboard output from system module
5	VBAT	Supply voltage for lighting (+6V nominal)
6	LCD_LIGHTS	Backlight on/off control from system module
7	LCD_CLOCK	Clock signal to display module
8	LCD_RES	Display driver reset signal from system module
9	XLCDEN	Display driver chip select from system module
10	C_XD	Display driver command/data line from system module
11	SCL	Display driver data clock from display module
12	VL2	+4.8V supply voltage to display module
13	XBUSY	LCD driver busy signal to system module
14	0V	Ground
15	SDA	Display driver data line from system module
16	V_LCD	Negative supply (nom. –3.5V) to display driver
17	EARP	Not used
18	EARM	Not used

Side Volume Connector J2

The side Volume Keys are connected to the main LCD flexi, J2.

Name	Description
ROW0	Keyboard input line to system module
COL2	Keyboard output line to system module
ROW1	Keyboard input line to system module
COL3	Keyboard output line to system module

Functional Description

Circuit Description

General

The Display Module consists of one IC, a display and LED backlighting.

Display Driver

The Display Driver D1 is a programmable LCD controller driver, which is able to drive the dot matrix LCD of up to 42 columns by 16–line multiplexing. D1 contains a 5x7 dot matrix character generator. Connection to the controller is via a serial link.

Display Driver D1 Signals

Pin	Name	Description
D0/S1	SDA	Serial data from radio module
D1/P/_S		Parallel/serial selection
D2/CAE		Chip address enable
D3/SO		Serial Data out (not used)
SYNC		Synchronous (grounded)
$\overline{SCK}$	Serial Clock	Data clock for serial data
C/$\overline{D}$	C_XD	Command/data input
CA0,CA1		Chip address
$\overline{CS}$	XLCDEN	Chip select
RESET		Reset signal input
CLOCK		External clock input
$\overline{BUSY}$	XBUSY	Busy signal output
VLC1–5		LCD drive voltage supply
C0–41		LCD column outputs
R0–15		LCD row outputs

LCD backlighting is provided by LED's V1, V2, V3 and V4. Constant current is supplied by the System Module.

Side Volume Connector

The display module contains side volume and on/off keys. The keys are connected to the System Module via the Display Module Connector J2. The buttons enable the user to alter the volume level and the on/off switch for the radio variants.

Supply Voltages and Power Consumption

The supply voltage for the display module is supplied from the radio module via the VL2 line (J2/12) and is available with the phone switched on or in the power–off charging mode.

The supply voltage for the backlighting LEDs is provided by the VBAT line (J2/5) and is available when the battery is connected. Typical current/voltage consumption values for the module are as follows:

Power Status	I/VL2	I/VBAT
Power off	0 mA	0 mA
Power on without lighting	1.5 mA	0 mA
Power on with lighting	1.5 mA	40 mA

Pin	Minimum	Typical	Maximum
VL2		+5 V	
VBAT	+5.25 V	+6 V	+ 9 V

Pin	Minimum	Typical	Maximum
VL2	1.1 mA	1.7 mA	1.8 mA
VBAT		40 mA	